catalog 63f

small basic switches

MICRO SWITCH

FREEPORT, ILLINOIS

A DIVISION OF HONEYWELL

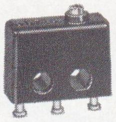
IN CANADA: HONEYWELL CONTROLS LIMITED, TORONTO 17, ONTARIO

In This Catalog - - - -

"V3" SERIES (Page 3)

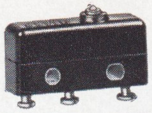
Postage-stamp sized "V3" switches are miniature switches with very high capacity and long life. This catalog shows but a few of the great number of "V3" assemblies. It details the standard terminal styles and contact arrangements.

TYPE 1SX1 (Page 6)



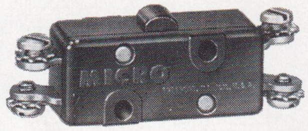
This is the smallest single-pole double-throw, snap-action switch available. For its size it has long life and ample electrical capacity. In this catalog are shown full details of this unit, as well as some of the auxiliary actuators now available for it. Type 1SX1 is fully qualified under military specifications.

"SM" SERIES (Page 8)



This series is made up of the widely used subminiature switches, first introduced by MICRO SWITCH in 1949. Type "SM" switches are used in hundreds of different assemblies made by MICRO SWITCH. Terminal variations and other special "SM" types are available. "SM" switches are fully qualified under military specifications.

"TB" SERIES (Page 12)



"TB" switches are twin-break units which offer a means of controlling isolated circuits in extremely compact units. These switches find many uses in modern control systems because of their flexibility. "TB" switches are fully qualified under military specifications.

Technical Information

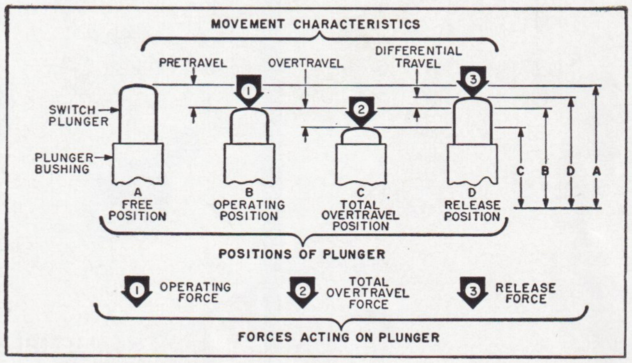
A BASIC SWITCH is a plastic cased switch with no additional enclosure or attachments.

SNAP-ACTION is the principle of operation of a MICRO SWITCH precision snap-action switch. When sufficient force is applied to the switch actuator the common contact snaps, at a very high speed, from the normally closed to the normally open contact. As pressure is released, the common contact snaps back to the normally closed position.

DIFFERENTIAL TRAVEL is the distance traveled between the **operating position** and the **release position.** This represents the minimum movement required to produce snap-action repeatedly. **Differential travel** is stated either as a maximum value or as a range between two limiting values.

OVERTRAVEL is the plunger or actuator travel safely available beyond the **operating position.** This is usually expressed as a minimum figure to indicate the least amount of overtravel to be found in any given switch.

PRETRAVEL is the distance traveled in driving the plunger or actuator from the **free position** to the **operating position.** This characteristic is usually stated as a maximum value.



NOTE: All characteristics are measured at no electrical load.

WARRANTY

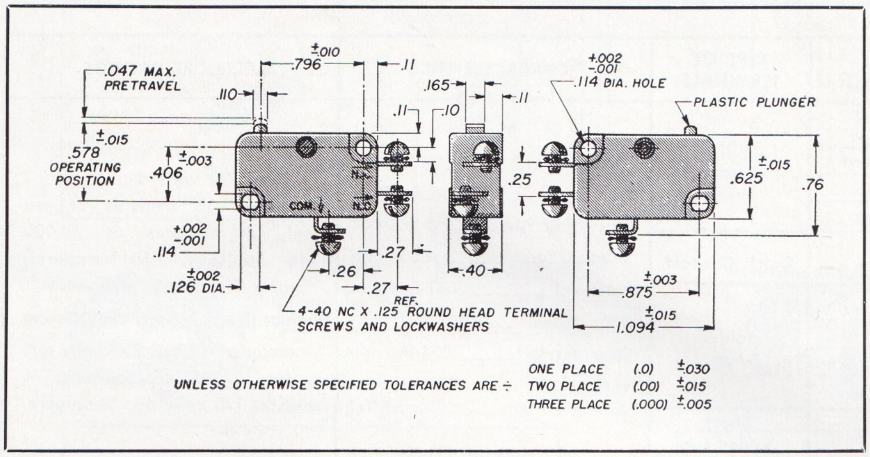
We warrant our products to be free from defects in material and workmanship and we will replace any such product we find to be so defective within one year after its delivery to the original purchaser. See List Price and Discount Schedule for full warranty details.

"V3" Basic Switches

MICRO SWITCH "V3" switches are postage-stamp sized precision switches which feature long operating life and high electrical capacity for their size. They meet designers' requirements for a miniature switch without sacrifice of quality.

Switch cases and plungers, except where noted, are of general-purpose phenolic or melamine materials. "V3" switches are especially adaptable to multiple cam-operated gang-mounted systems. See illustrations below. Standard "V3" switches are suitable for operation in temperatures up to 180° F. Special high-temperature versions, using synthetic mica cases, withstand temperatures up to 600° F. Mechanical life with 0.015-inch overtravel is 140,000 operations, minimum; 1,000,000 operations median. The long life switch insures a median life of 10,000,000 operations.

A wide variety of "V3" switch types are tabulated on Page 4, according to operating characteristics, electrical capacities, terminal variations and circuitry. Single-pole double-throw, single-pole normally-open and single-pole normally-closed versions are available.


.047 MAX. PRETRAVEL
±.010
.796
.11
+.002 -.001
.114 DIA. HOLE
.165
.11
.10
.11
PLASTIC PLUNGER
.110
±.015
.578
OPERATING POSITION
±.003
.406
N.C.
N.O.
COM.
.25
±.015
.625
.76
+.002 -.001
.114
±.002
.126 DIA.
.26
.27
.27 REF.
.40
±.003
.875
±.015
1.094
4-40 NC X .125 ROUND HEAD TERMINAL SCREWS AND LOCKWASHERS
UNLESS OTHERWISE SPECIFIED TOLERANCES ARE ÷
ONE PLACE (.0) ±.030
TWO PLACE (.00) ±.015
THREE PLACE (.000) ±.005

MICRO
FREEPORT, ILLINOIS U.S.A.
COM.
N.C.
N.O.

V3-1
(MS25253-4)
SPDT

The standard "V3" switch illustrated above and at left is single-pole double-throw. Dimensions of other "V3's" are the same, except for the various terminal configurations (see drawings, Page 4).

MICRO
FREEPORT, ILLINOIS U.S.A.
COM.

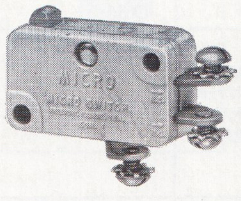
V3-21
SP-NC

MICRO
FREEPORT, ILLINOIS U.S.A.
COM.

V3-23
SP-NO

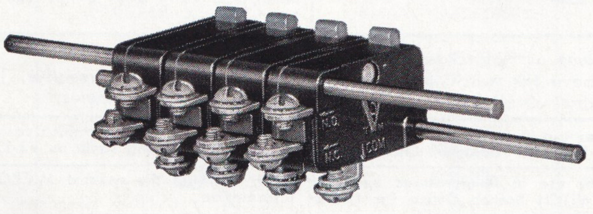
MICRO
FREEPORT, ILLINOIS U.S.A.
COM.
N.O.

V3-601
(extra-long life)
SPDT


MICRO
MICRO SWITCH

V3-1301
(high-temperature)
SPDT

MULTIPLE MOUNTING

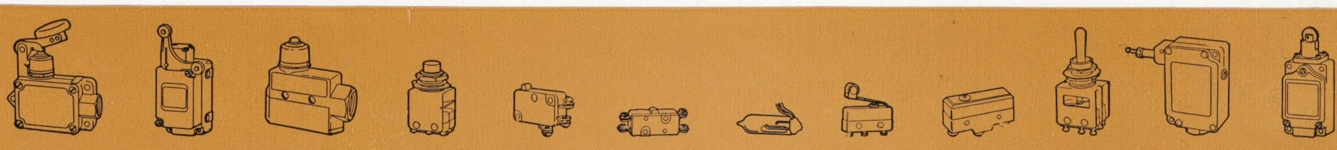


Gang Mounted
V3-1 Switches

Flat bosses around each mounting hole and on both sides of the plastic case facilitate multiple mounting on common mounting screws or rods for multiple control of numerous electrical circuits.

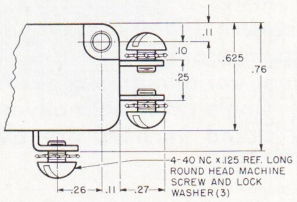
V3 switches are also available enclosed within die-cast aluminum housings with many different types of actuators.

Dimensions shown are for reference only and are subject to change without notice. Current drawings will be supplied upon request.

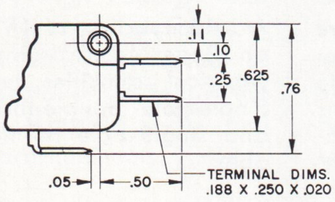


"V3" Basic Switches

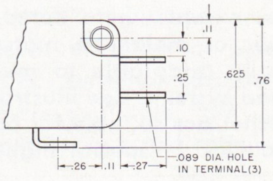
"V3" switches are available in a wide variety of terminal designs, contact arrangements and operating characteristics. Special switch case materials are used to meet requirements not met by phenolic or melamine materials. Catalog Listings V3-401 and V3-419 have glass filled alkyd cases for added strength. V3-29 has an asbestos filled phenolic case. V3-1301 has a special synthetic mica case.


.11
.10
.25
.625
.76
4-40 NC x .125 REF. LONG ROUND HEAD MACHINE SCREW AND LOCK WASHER (3)
.26
.11
.27

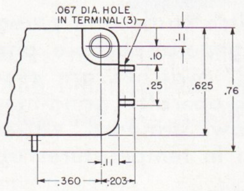
SCREW TERMINALS



QUICK CONNECT TERMINALS



SOLDER LUG TERMINALS



SHORT SOLDER LUG TERMINALS

TYPE	CATALOG LISTING	CONTACT ARRANGEMENT	TYPE OF TERMINALS	CHARACTERISTICS	ELECTRICAL RATINGS
GENERAL PURPOSE	V3-1 (MS25253-4)	Double-Throw	Screw	Operating Force ___ 6 to 14 oz. Release Force _____ 4 oz., min. Pretravel _______ .047 in., max. Diff. Travel ____ .006 to .016 in. Overtravel ______ .031 in., min. Weight ________ .017 lb., max.	**30 volts d-c:** *Inductive, 10 amperes at sea level, 6 amperes at 50,000 feet; resistive, 10 amperes; **motor load, 6 amperes. **Underwriters' Laboratories Listing** 15 amperes, 125 or 250 volts a-c; ⅓ hp. 125-250 volts a-c; ½ ampere, 125 volts d-c; ¼ ampere, 250 volts d-c.
	V3-21	Normally-Closed			
	V3-23	Normally-Open			
	V3-401	Double-Throw			
	V3-1-D8	Double-Throw	Quick Connect		
	V3-19	Double-Throw	Solder Lug		
	V3-7	Normally-Closed			
	V3-32	Normally-Open			
	V3-419	Double-Throw			
	V3-15	Double-Throw	Short Solder Lug		
	V3-29	Double-Throw	Screw		
LONG LIFE	V3-601	Double-Throw	Screw	Same as above — except — Overtravel _____ .010-.024 in.	Same as above except motor rating is ⅓ hp. 125-250 volts a-c.
LOW DIFFERENTIAL TRAVEL	V3-26	Double-Throw	Screw	Operating Force ___ 7 to 12 oz. Release Force ______ 5 oz., min. Pretravel ________ .047 in., max. Diff. Travel ____ .002 to .006 in. Overtravel ________ .031 in., min. Weight __________ .017 lb., max.	**30 volts d-c:** *inductive, 1 ampere at sea level, 1 ampere at 50,000 feet; resistive, 2 amperes; **motor load, 1 ampere. **Underwriters' Laboratories Listing** 10 amperes, 125 or 250 volts a-c.
LOW OPERATING FORCE	V3-101	Double-Throw	Screw	Operating Force __ 8 oz., max. Release Force ______ 2 oz., min. Pretravel _______ .047 in., max. Diff. Travel ____ .006 to .016 in. Overtravel ______ .031 in., min. Weight _________ .017 lb., max.	**30 volts d-c:** *inductive, 5 amperes at sea level, 5 amperes at 50,000 feet; resistive, 5 amperes; **motor load, 5 amperes. **Underwriters' Laboratories Listing** 10 amperes, 125 or 250 volts a-c; ½ ampere, 125 volts d-c; ¼ ampere, 250 volts d-c; ⅓ hp. 125-250 volts a-c.
	V3-121	Normally-Closed			
	V3-123	Normally-Open			
	V3-119	Double-Throw	Solder Lug		
GOLD CONTACTS	V3-75	Double-Throw	Screw	Same as "GENERAL PURPOSE", above. For switching low energy "dry" circuits	**28 volts d-c:** inductive, ½ ampere; resistive, 1 ampere; inrush, 2 amperes.
HIGH TEMPERATURE	V3-1301	Double-Throw	Screw	**For use in temperatures up to +600°F.** Special type synthetic mica case withstands radiation. Characteristics and electrical rating same as V3-1.	
	V3-245	Double-Throw	Screw	**For use in temperatures up to +400°F.** Contact the nearest MICRO SWITCH Branch Office for further information.	

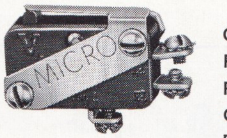
* Inductive circuits in accordance with AN3179.

** Motor load rating based on starting current not greater than six times rated running current shown.

Dimensions shown are for reference only and are subject to change without notice. Current drawings will be supplied upon request.

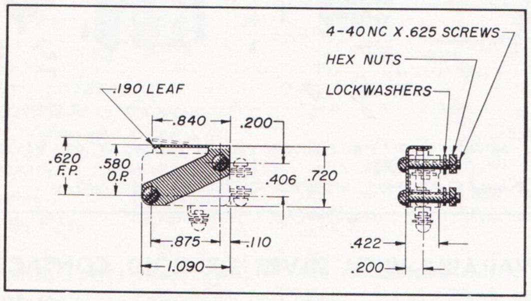
Auxiliary Actuators For "V3" Switches

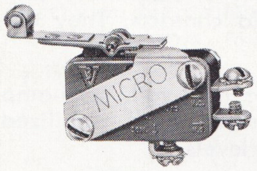
MICRO SWITCH series "JV" auxiliary actuators permit operation of "V3" switches by cams, slides or other mechanical means, which are not in line with the motion of the switch plunger. In addition these stainless steel actuators offer some protection to the precision switches, absorbing the side thrust which a cam or slide might exert on the switch plunger. **"JV" actuators are sold separately, unassembled.** Mounting screws, which also serve as assembly screws, nuts and lockwashers are furnished with each actuator. **Characteristics shown are with actuator on V3-1 switch.**



JV-1 LEAF TYPE

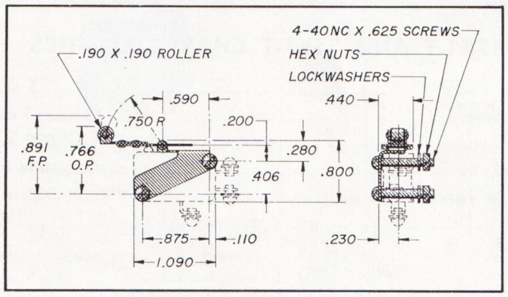
Operating Force	18 oz., max.
Release Force	6 oz., min.
Pretravel	.047 in., max.
Overtravel	.031 in., min.
Differential Travel	.006-.016 in.

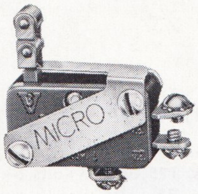

4-40NC X .625 SCREWS
HEX NUTS
LOCKWASHERS
.190 LEAF
.840
.200
.620 F.P.
.580 O.P.
.406
.720
.875
.110
1.090
.422
.200



JV-20 ROLLER LEVER

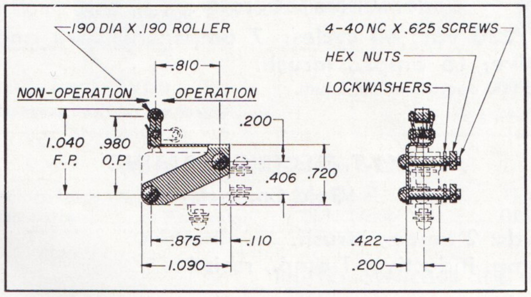
Operating Force	5 oz., max.
Release Force	1 oz., min.
Pretravel	.188 in., max.
Overtravel	.062 in., min.
Differential Travel	.078 in., max.

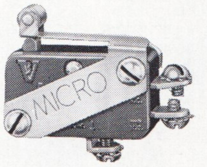

4-40NC X .625 SCREWS
HEX NUTS
LOCKWASHERS
.190 X .190 ROLLER
.590
.750 R
.200
.440
.280
.891 F.P.
.766 O.P.
.406
.800
.875
.110
1.090
.230



JV-30 ONE-WAY ROLLER

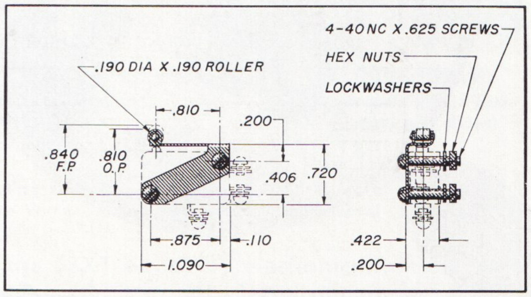
Operating Force	18 oz., max.
Pretravel	.080 in., max.
Overtravel	.020 in., min.

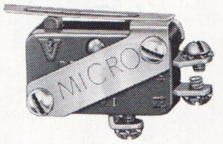

.190 DIA X .190 ROLLER
4-40NC X .625 SCREWS
HEX NUTS
LOCKWASHERS
.810
NON-OPERATION
OPERATION
.200
1.040 F.P.
.980 O.P.
.406
.720
.875
.110
1.090
.422
.200



JV-5 ROLLER LEAF

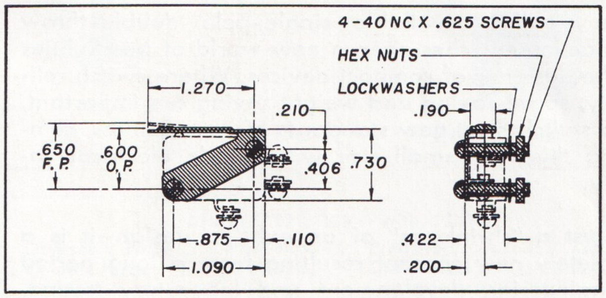
Operating Force	18 oz., max.
Release Force	4 oz., min.
Pretravel	.060 in., max.
Overtravel	.031 in., min.
Differential Travel	.006-.016 in.

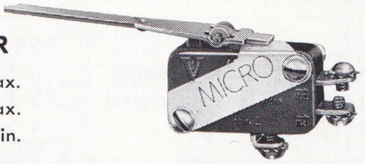

4-40NC X .625 SCREWS
HEX NUTS
LOCKWASHERS
.190 DIA X .190 ROLLER
.810
.200
.840 F.P.
.810 O.P.
.406
.720
.875
.110
1.090
.422
.200



JV-7 LONG LEAF

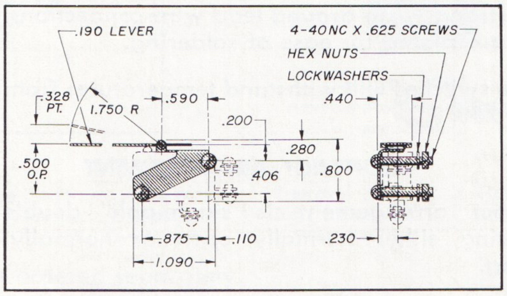
Operating Force	15 oz., max.
Release Force	6 oz., min.
Overtravel	.050 in., min.
Differential Travel	.025 in., max.


4-40 NC X .625 SCREWS
HEX NUTS
LOCKWASHERS
1.270
.210
.190
.650 F.P.
.600 O.P.
.406
.730
.875
.110
1.090
.422
.200



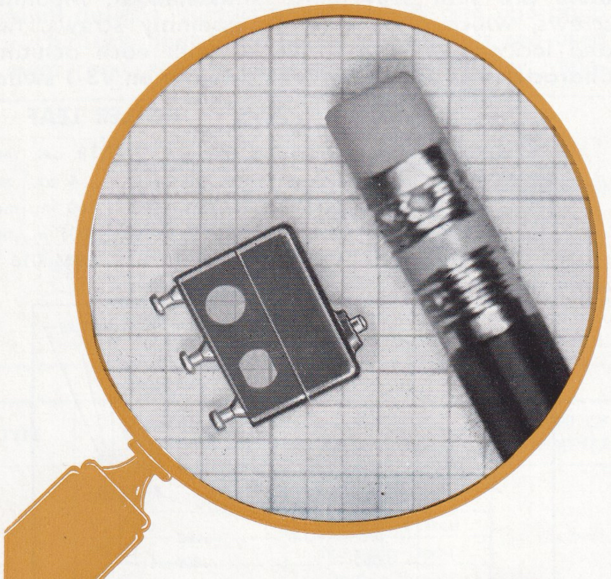
JV-26 LONG LEVER

Operating Force	2¼ oz., max.
Release Force	¼ oz., min.
Overtravel	.141 in., min.
Differential Travel	.187 in., max.

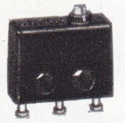

.190 LEVER
4-40NC X .625 SCREWS
HEX NUTS
LOCKWASHERS
.328 PT.
1.750 R
.590
.200
.440
.280
.500 O.P.
.406
.800
.875
.110
1.090
.230

Dimensions shown are for reference only and are subject to change without notice. Current drawings will be supplied upon request.

"1SX" Subminiature Basic Switches



Catalog Listings 1SX1-T (MS24547-1) and 3SX1-T



Actual Size

FEATURES

These smallest available single-pole double-throw snap-action switches open a new world of possibilities for the designer of compact devices. Where switch reliability, space-saving and weight-saving are important, these switches set new standards of compactness, combining this new small size with ample electrical capacity.

Not just a "shrinkage" of an existing design—it is a completely new concept resulting from a long period of engineering development and laboratory testing, coupled with years of basic experience in precision switching.

Case, cover and plunger are made of high-strength plastic. The unique, snap-action spring is fabricated of beryllium copper.

Turret-type terminals are used, permitting easy wiring and strong wrap-around lead wire connections. Terminals are plated for ease of soldering.

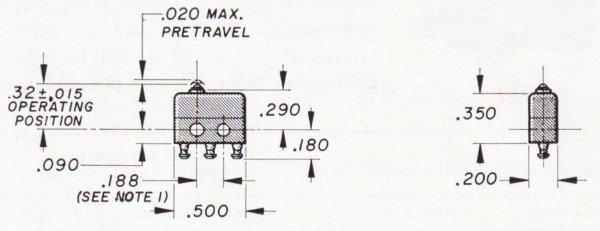
These switches will withstand temperatures from —100° to +250°F.

CONTACT ARRANGEMENT

Contact arrangement is single-pole double-throw, allowing either normally open or normally closed wiring.

TWO-HOLE MOUNTING

The two mounting holes will accept No. 2 screws. One hole is slightly elongated to simplify positioning of the switch.



NOTE –
1- MOUNTING HOLES WILL ACCEPT PINS OR SCREWS OF .087 MAX. DIA. ON .188 CENTERS.
2-UNLESS OTHERWISE SPECIFIED TOLERANCES ARE ±.010.

AVAILABLE WITH SILVER OR GOLD CONTACTS

Catalog Listings 1SX1-T (MS24547-1) has silver contacts, while the 3SX1-T has gold contacts. They are dimensionally identical.

Gold contacts allow switching of milli-volt, milli-amp dry circuits, providing contact surety and stabilized contact resistance at low energy levels.

1SX1-T AND 3SX1-T CHARACTERISITICS

Operating Force	5 oz. max.
Release Force	1 oz. min.
Pretravel	.020 in. max.
Overtravel	.004 in. min.
Differential Travel	.005 in. max.
Weight	$^1/_{28}$ oz.

1SX1-T ELECTRICAL RATING
(Silver Contacts)

***28 vdc:** 7 amps., resistive;
4 amps., inductive (sea level);
2.5 amps., inductive (50,000 feet);
4 amps. motor load; 2.5 amps., lamp load;
24 amps., maximum inrush.

Underwriters Laboratories' Listing.

***115/230 vac, 60 cycles:** 7 amps., resistive and inductive; 15 amps., inrush.

*For 25,000 operations minimum.

3SX1-T ELECTRICAL RATING
(Gold Contacts)

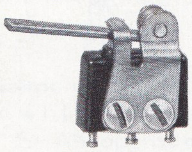
28 vdc: 2 amps., inrush.
.5 amp. inductive; 1 amp., resistive.

Dimensions shown are for reference only and are subject to change without notice. Current drawings will be supplied upon request.

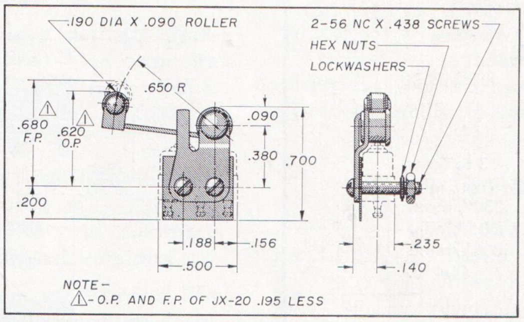
Auxiliary Actuators For "1SX" Switches

Lever and roller-lever type: These actuators are for use where lowest operating force is available and longest actuator life is a requirement. Low operating force results from pivot-type construction, which provides a hinge action rather than a spring action. MICRO SWITCH lever actuators are fabricated of corrosion-resistant steel. Two assembly-mounting screws, nuts, lockwashers and an insulator are furnished with each actuator.

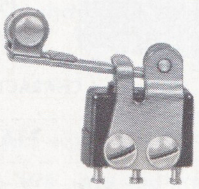
JX-20



Lever Type
(low-force, for slow cams and slides)


.190 DIA X .090 ROLLER
2-56 NC X .438 SCREWS
HEX NUTS
LOCKWASHERS
.650 R
.680 F.P.
.620 O.P.
.090
.380
.700
.200
.188
.156
.500
.235
.140
NOTE –
O.P. AND F.P. OF JX-20 .195 LESS

JX-25



Roller Lever
(low-force, for fast cams and slides)

CHARACTERISTICS — with 1SX1-T (JX-20)

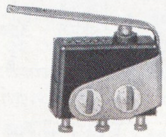
Operating Force	1 oz. approx.	Diff. Travel	.030″ approx.
Release Force	4 grams min.	Overtravel	.030″ approx.

CHARACTERISTICS — with 1SX1-T (JX-25)

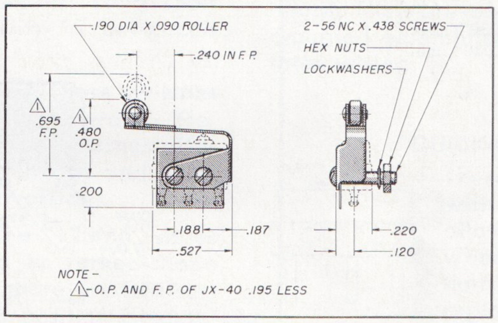
Operating Force	1 oz. approx.	Diff. Travel	.030″ approx.
Release Force	4 grams min.	Overtravel	.030″ approx.

Leaf and roller-leaf type: These actuators permit operation of the 1SX1 switch by mechanical means which are not always in line with plunger travel. They absorb side thrust which results from a cam or slide acting directly on the switch plunger. Leaf-type actuators are fabricated from corrosion-resistant steel. Two assembly-mounting screws, nuts, lockwashers and an insulator are furnished with each actuator.

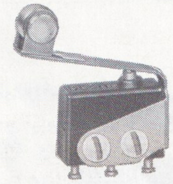
JX-40



Leaf Type
(for slow cams and slides)


.190 DIA X .090 ROLLER
.240 IN F.P.
2-56 NC X .438 SCREWS
HEX NUTS
LOCKWASHERS
.695 F.P.
.480 O.P.
.200
.188
.187
.527
.220
.120
NOTE –
O.P. AND F.P. OF JX-40 .195 LESS

JX-45



Roller Leaf
(for fast cams and slides)

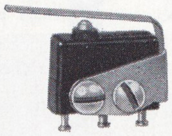
CHARACTERISTICS — with 1SX1-T (JX-40)

Operating Force	7 oz. max.	Pretravel	.225″ max.
Release Force	2 oz. min.	Diff. Travel	.025″ max.
		Overtravel	.015″ min.

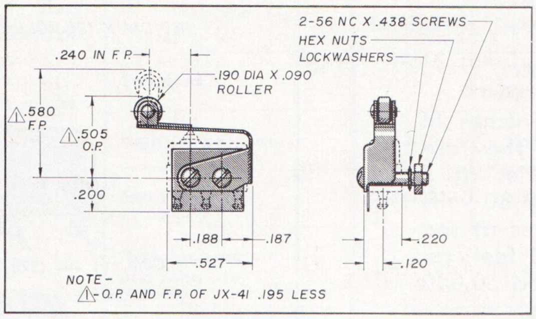
CHARACTERISTICS — with 1SX1-T (JX-45)

Operating Force	7 oz. max.	Pretravel	.225″ max.
Release Force	2 oz. min.	Diff. Travel	.025″ max.
		Overtravel	.015″ min.

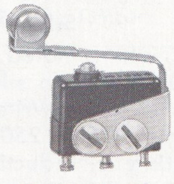
JX-41



Leaf Type
(reverse position for lower pretravel)


2-56 NC X .438 SCREWS
HEX NUTS
LOCKWASHERS
.240 IN F.P.
.190 DIA X .090 ROLLER
.580 F.P.
.505 O.P.
.200
.188
.187
.527
.220
.120
NOTE –
O.P. AND F.P. OF JX-41 .195 LESS

JX-51



Roller Leaf
(reverse position for lower pretravel)

CHARACTERISTICS — with 1SX1-T (JX-41)

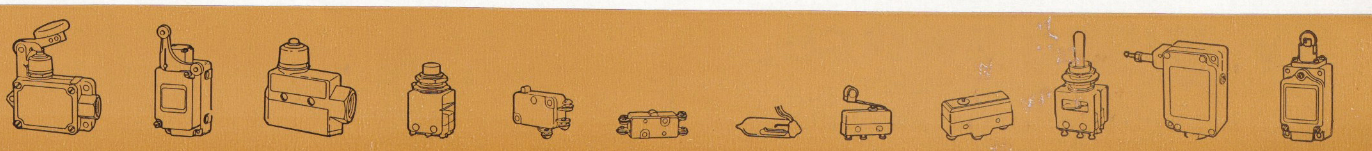
Operating Force	6 oz. max.	Pretravel	.110″ max.
Release Force	2 oz. min.	Diff. Travel	.025″ max.
		Overtravel	.015″ min.

CHARACTERISTICS — with 1SX1-T (JX-51)

Operating Force	6 oz. max.	Pretravel	.110″ max.
Release Force	2 oz. min.	Diff. Travel	.025″ max.
		Overtravel	.015″ min.

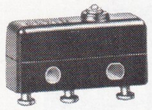
NOTE: Switches and actuators must be ordered separately.

Dimensions shown are for reference only and are subject to change without notice. Current drawings will be supplied upon request.



"SM" Subminiature Basic Switches

"SM" series subminiature switches combine small size and light weight with ample capacity, precision operation and long life. The switches shown on this page are for use in a temperature range of −100°F to +180°F. Minimum life is 50,000 operations. Other types of "SM" switches constructed for special requirements are discussed on Page 9.

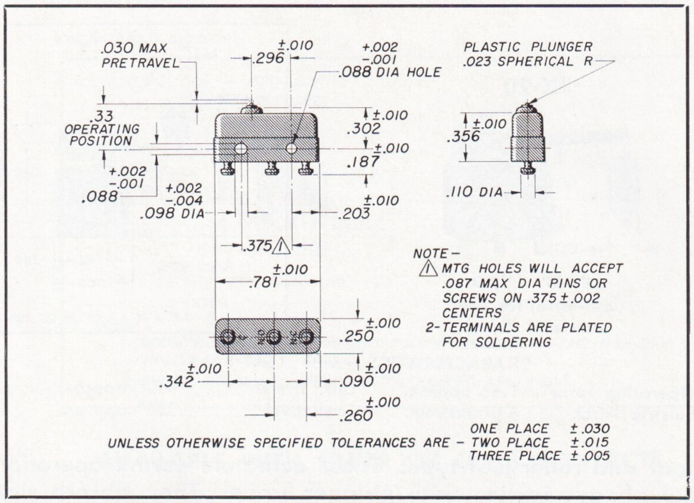


PIN PLUNGER

1SM1-T

CHARACTERISTICS

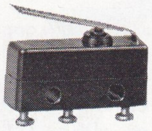
Operating Force	3 to 5 oz.
Release Force	1 oz., min.
Pretravel	.030", max.
Overtravel	.005", min.
Movement Differential	.004", max.
Weight	.004 lb.



.030 MAX PRETRAVEL
±.010
.296
+.002 −.001 .088 DIA HOLE
PLASTIC PLUNGER .023 SPHERICAL R
.33 OPERATING POSITION
±.010 .302
±.010 .187
+.002 −.001 .088
+.002 −.004 .098 DIA
±.010 .203
±.010 .356
.110 DIA
.375⚠
±.010 .781
±.010 .250
±.010 .342
±.010 .090
±.010 .260

NOTE –
⚠ MTG HOLES WILL ACCEPT .087 MAX DIA PINS OR SCREWS ON .375±.002 CENTERS
2-TERMINALS ARE PLATED FOR SOLDERING

UNLESS OTHERWISE SPECIFIED TOLERANCES ARE – ONE PLACE ±.030
TWO PLACE ±.015
THREE PLACE ±.005

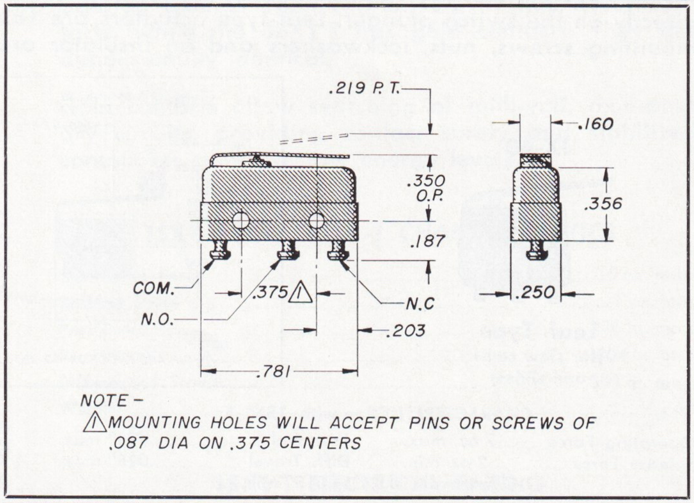


LEAF

111SM1-T

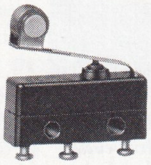
CHARACTERISTICS

Operating Force	7 oz., max.
Release Force	2 oz., min.
Differential Travel	.030", max.
Overtravel	.030", min.



.219 P.T.
.160
.350 O.P.
.356
.187
COM.
N.O.
.375⚠
N.C
.203
.250
.781

NOTE –
⚠ MOUNTING HOLES WILL ACCEPT PINS OR SCREWS OF .087 DIA ON .375 CENTERS

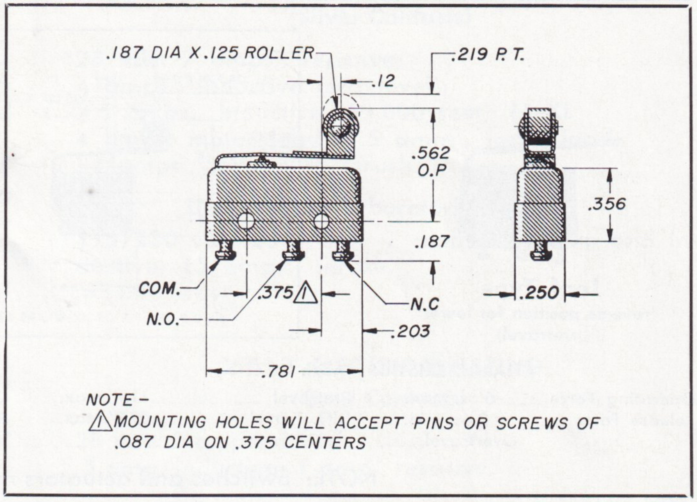


ROLLER LEAF

111SM2-T

CHARACTERISTICS

Operating Force	7 oz., max.
Release Force	2 oz., min.
Differential Travel	.025", max.
Overtravel	.030", min.



.187 DIA X .125 ROLLER
.219 P.T.
.12
.562 O.P
.356
.187
COM.
N.O.
.375⚠
N.C
.203
.250
.781

NOTE –
⚠ MOUNTING HOLES WILL ACCEPT PINS OR SCREWS OF .087 DIA ON .375 CENTERS

ELECTRICAL RATING

Silver Contacts

Except where noted, all "SM" switches in this catalog have silver contacts. They are listed by Underwriters' Laboratories at 5 amperes, 125 or 250 volts a-c. The 30 volts d-c rating is: inductive, 3 amperes at sea level and 2.5 amperes at 50,000 feet; resistive, 5 amperes at sea level and 50,000 feet; maximum inrush 24 amperes.

Gold Contacts

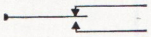
The 30 volts d-c ratings: inductive, .5 ampere at sea level and 50,000 feet; resistive, 1 ampere at sea level and 50,000 feet; maximum inrush, 2 amperes.

Dimensions shown are for reference only and are subject to change without notice. Current drawings will be supplied upon request.

"SM" Subminiature Basic Switches

CONTACT ARRANGEMENT

All "SM" switches in this catalog are single-pole double-throw.



"SM" SWITCH TYPES

Standard: This is the general-purpose series. Characteristics are those given for type 1SM1-T on opposite page. Minimum mechanical life is 50,000 operations. They will withstand temperatures from —100° to +180° F.

High Temperature: Switches of the high-temperature group will withstand temperatures of —100° to +250° F. All operating characteristics and electrical ratings are the same as for the standard versions.

Long-Life: The long-life version offers mechanical life in excess of 1 million operations by limiting plunger overtravel to .003" min. and pretravel to .020" max. Other characteristics and electrical ratings are the same as standard.

High-Temperature and Long-Life Combination: This group combines the features and characteristics of the two above groups.

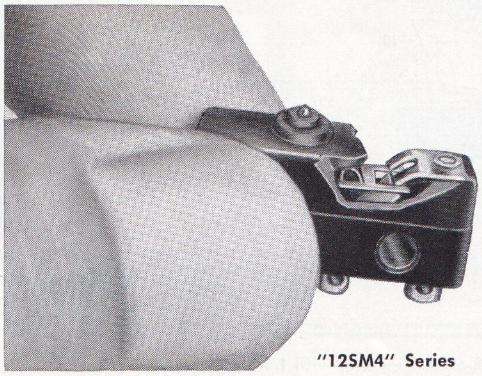
Gold Contacts: This specialized type is for the use in switching dry (very low-energy) circuits. Long shelf life gives this switch great reliability in dry-circuit operation.

Long Life and Gold Contacts Combined: These switches are for dry-circuit uses in which considerable frequency of operation is encountered. The switches offer the mechanical life and have the pretravel and overtravel characteristics of the long-life versions.

Unique Bifurcated Contact Design: The "12SM4" series has specially constructed bifurcated or forked-shape gold-plated contact structures. Thus, there are **two** surfaces making contact in each switch position (see cutaway in photograph, below).

Laboratory tests show that bifurcated contacts increase the probability to make contact even in the presence of particle contamination. This unique design also gives increased reliability in the control of milli-volt, milli-amp (dry) circuits.

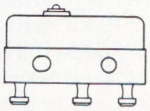
This cutaway view shows the internal details of the bifurcated contact switch design.



"12SM4" Series

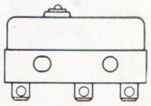
"SM" TERMINAL VARIATIONS

"T" TERMINALS



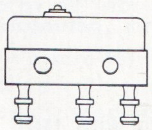
These terminals are recommended for general-purpose use. The turret design allows easy attachment of wires for solder connections and also permits solderless wraparound connections. Terminals are plated to facilitate soldering.

SOLDER TERMINALS



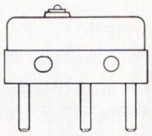
In this type, wires are inserted in the holes and then soldered, making mechanically strong connections. Terminals are plated to facilitate soldering.

"T2" TERMINALS



These double-turret terminals offer the same advantage as the "T" terminals, but with two wiring spaces per terminal. These are useful where more than one wire must be attached to each terminal. They are also advantageous for use in gang-mounted assemblies, where their added length facilitates wiring.

"QUICK-CONNECT" TERMINALS

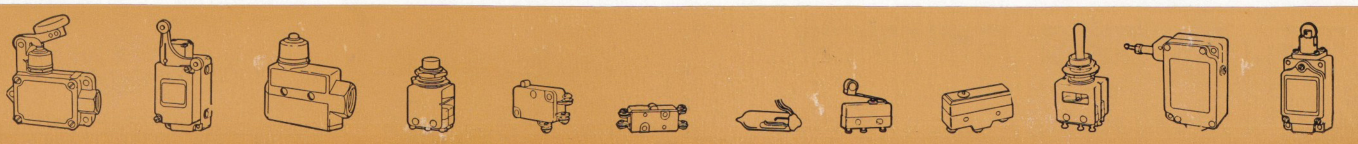


These terminals are designed for use with A.M.P. #42429 connectors. They allow quick, sure, solderless wiring when using "SM" switches in applications requiring speedy assembly or replacement.

CATALOG LISTINGS — "SM" BASIC SWITCHES

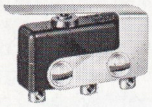
Type	"T" Terminals	Solder Terminals	"T2" Terminals	Quick-Connect Terminals
Standard	1SM1-T	1SM1 (MS25085-1)	1SM1-T2	1SM1-H2
High Temperature	1SM3-T	1SM3	1SM3-T2	1SM3-H2
Extra Long Life	11SM1-T	11SM1	11SM1-T2	11SM1-H2
High Temperature and Long Life	11SM3-T	11SM3	11SM3-T2	11SM3-H2
Gold Contacts	1SM23-T	1SM23	1SM23-T2	1SM23-H2
Gold — Extra Long Life	11SM23-T	11SM23	11SM23-T2	11SM23-H2
Bifurcated Gold Contacts	12SM4-T	12SM4	12SM4-T2	12SM4-H2

For data on auxiliary actuators for "SM" series, see Pages 10 and 11.



Auxiliary Actuators For "SM" Switches

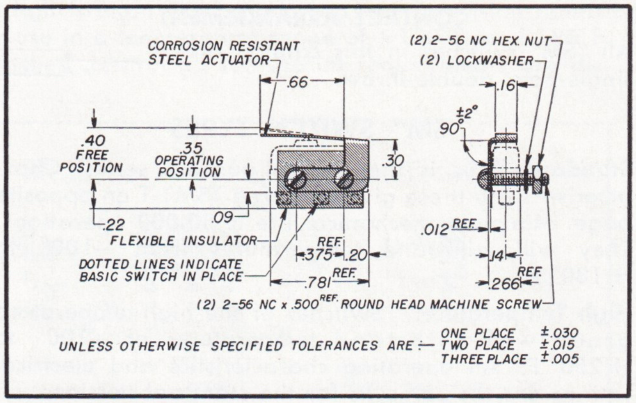
JS-2 STRAIGHT LEAF



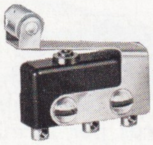
This illustration shows the Subminiature switch assembled in the JS-2 actuator. Switches and actuators must be ordered separately.

CHARACTERISTICS OF JS-2 ACTUATOR ASSEMBLED WITH 1SM1 SUBMINIATURE SWITCH

Operating Force	10 oz., max.	Overtravel	.015 in., min.
Release Force	2 oz., min.	Diff. Travel	.015 in., max.
Pretravel	.078 in., max.	Weight, with switch	.008 lb.


CORROSION RESISTANT STEEL ACTUATOR
(2) 2-56 NC HEX. NUT
(2) LOCKWASHER
.66
.16
±2°
90°
.40 FREE POSITION
.35 OPERATING POSITION
.30
.22
.09
FLEXIBLE INSULATOR
.012 REF.
REF. .375
.20
.14
DOTTED LINES INDICATE BASIC SWITCH IN PLACE
.781 REF.
.266 REF.
(2) 2-56 NC x .500 REF. ROUND HEAD MACHINE SCREW
UNLESS OTHERWISE SPECIFIED TOLERANCES ARE :— ONE PLACE ±.030 TWO PLACE ±.015 THREE PLACE ±.005

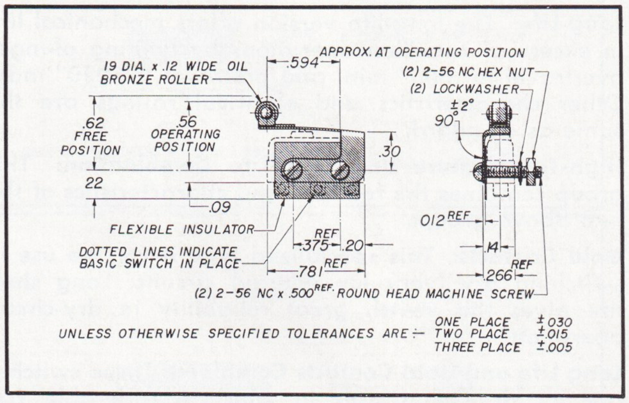
JS-5 ROLLER LEAF



This illustration shows the Subminiature switch assembled in the JS-5 actuator. Switches and actuators must be ordered separately.

CHARACTERISTICS OF JS-5 ACTUATOR ASSEMBLED WITH 1SM1 SUBMINIATURE SWITCH

Operating Force	10 oz., max.	Overtravel	.015 in., min.
Release Force	3 oz., min.	Diff. Travel	.015 in., max.
Pretravel	.078 in., max.	Weight, with switch	.010 lb.

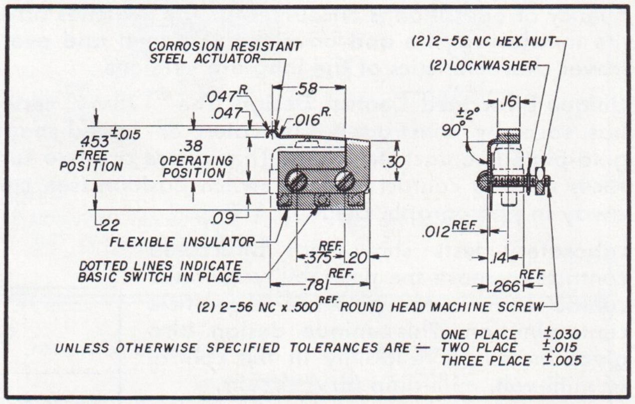

APPROX. AT OPERATING POSITION
19 DIA. x .12 WIDE OIL BRONZE ROLLER
.594
(2) 2-56 NC HEX NUT
(2) LOCKWASHER
±2°
90°
.62 FREE POSITION
.56 OPERATING POSITION
.30
.22
.09
FLEXIBLE INSULATOR
.012 REF.
REF. .375
.20
.14
DOTTED LINES INDICATE BASIC SWITCH IN PLACE
.781 REF.
.266 REF.
(2) 2-56 NC x .500 REF. ROUND HEAD MACHINE SCREW
UNLESS OTHERWISE SPECIFIED TOLERANCES ARE :— ONE PLACE ±.030 TWO PLACE ±.015 THREE PLACE ±.005

JS-7 FORMED LEAF

This illustration shows the Subminiature switch assembled in the JS-7 actuator. Switches and actuators must be ordered separately.

CHARACTERISTICS OF JS-7 ACTUATOR ASSEMBLED WITH 1SM1 SUBMINIATURE SWITCH

Operating Force	10 oz., max.	Overtravel	.031 in., min.
Release Force	2 oz., min.	Diff. Travel	.015 in., max.
Pretravel	.094 in., max.	Weight, with switch	.006 lb.

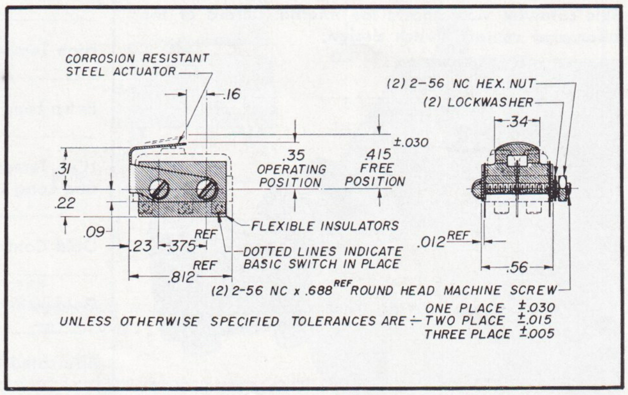

CORROSION RESISTANT STEEL ACTUATOR
(2) 2-56 NC HEX. NUT
(2) LOCKWASHER
.047 R.
.047
.58
.016 R.
.16
±2°
90°
.453 ±.015 FREE POSITION
.38 OPERATING POSITION
.30
.22
.09
FLEXIBLE INSULATOR
.012 REF.
REF. .375
.20
.14
DOTTED LINES INDICATE BASIC SWITCH IN PLACE
.781 REF.
.266 REF.
(2) 2-56 NC x .500 REF. ROUND HEAD MACHINE SCREW
UNLESS OTHERWISE SPECIFIED TOLERANCES ARE :— ONE PLACE ±.030 TWO PLACE ±.015 THREE PLACE ±.005

JS-33 TANDEM LEAF

This illustration shows the JS-33 assembled with 2 type "SM" Subminiature switches. Switches and actuators must be ordered separately.

CHARACTERISTICS OF JS-33 ASSEMBLED WITH 2 1SM1 SWITCHES

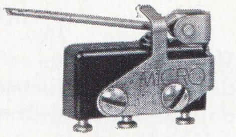
Operating Force	18 oz., max.	Diff. Travel	.015 in., max.
Release Force	10 oz., min.	Wt.	.113 oz. (without switches)


CORROSION RESISTANT STEEL ACTUATOR
.16
(2) 2-56 NC HEX. NUT
(2) LOCKWASHER
.34
±.030
.31
.35 OPERATING POSITION
.415 FREE POSITION
.22
.09
FLEXIBLE INSULATORS
.012 REF
.23
REF .375
DOTTED LINES INDICATE BASIC SWITCH IN PLACE
REF .812
.56
(2) 2-56 NC x .688 REF ROUND HEAD MACHINE SCREW
UNLESS OTHERWISE SPECIFIED TOLERANCES ARE :— ONE PLACE ±.030 TWO PLACE ±.015 THREE PLACE ±.005

Dimensions shown are for reference only and are subject to change without notice. Current drawings will be supplied upon request.

Auxiliary Actuators For "SM" Switches

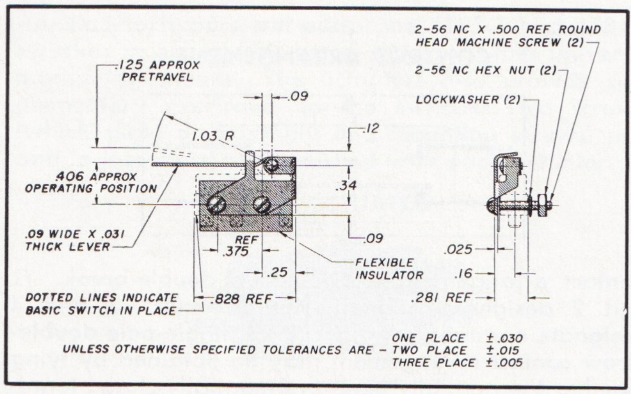
JS-220 STRAIGHT LEVER



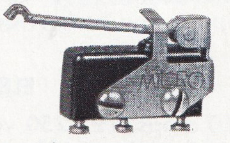
This lever-type actuator is for use with "SM" switches in applications where lowest operating force and longest actuator life are requirements. The straight-lever type is recommended for use with slow cams and slides. Two screws, lockwashers and an insulator are supplied with each actuator. Switches and actuators must be ordered separately.

CHARACTERISTICS — WITH 1SM1

Operating Force ___ 1 oz., max.
Release Force ____4 grams, min.
Diff. Travel ______.030 in., max.
Overtravel ______ .030 in., min.


2-56 NC X .500 REF ROUND HEAD MACHINE SCREW (2)
2-56 NC HEX NUT (2)
LOCKWASHER (2)
.125 APPROX PRETRAVEL
.09
1.03 R
.12
.406 APPROX OPERATING POSITION
.34
.09 WIDE X .031 THICK LEVER
REF .375
.09
.025
.25
FLEXIBLE INSULATOR
.16
DOTTED LINES INDICATE BASIC SWITCH IN PLACE
.828 REF
.281 REF
UNLESS OTHERWISE SPECIFIED TOLERANCES ARE - ONE PLACE ±.030 TWO PLACE ±.015 THREE PLACE ±.005

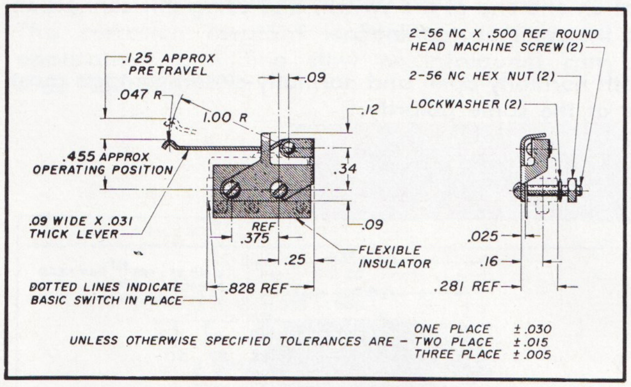
JS-221 FORMED LEVER



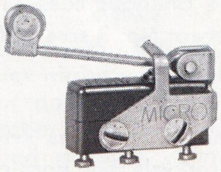
This actuator is basically the same as the JS-220 above, but incorporates a special bend to provide more precise operation when used with small cams. Two screws, nuts, lockwashers and insulator are supplied with each actuator. Switches and actuators must be ordered separately.

CHARACTERISTICS — WITH 1SM1

Operating Force ___ 1 oz., max.
Release Force ___ 4 grams, min.
Diff. Travel ______.030 in., max.
Overtravel _______ .030 in., min.


2-56 NC X .500 REF ROUND HEAD MACHINE SCREW (2)
2-56 NC HEX NUT (2)
LOCKWASHER (2)
.125 APPROX PRETRAVEL
.09
.047 R
1.00 R
.12
.455 APPROX OPERATING POSITION
.34
.09 WIDE X .031 THICK LEVER
REF .375
.09
.025
.25
FLEXIBLE INSULATOR
.16
DOTTED LINES INDICATE BASIC SWITCH IN PLACE
.828 REF
.281 REF
UNLESS OTHERWISE SPECIFIED TOLERANCES ARE - ONE PLACE ±.030 TWO PLACE ±.015 THREE PLACE ±.005

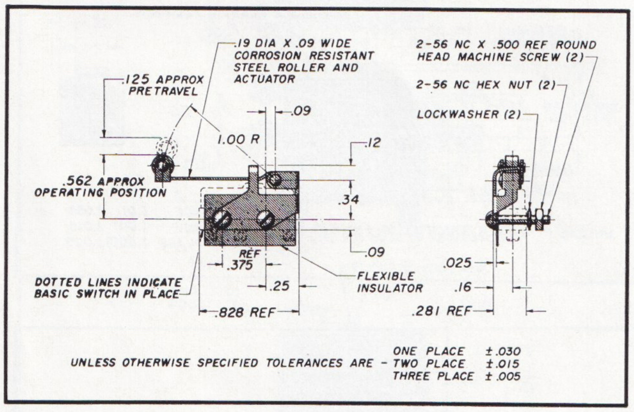
JS-246 ROLLER LEVER



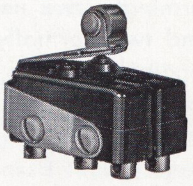
This roller-lever actuator is recommended for use in high-speed, low-friction applications, such as with fast-moving cams and slides. The pivot design provides low force and long actuator life. Two screws, nuts, lockwashers and an insulator are supplied with each actuator. Switches and actuators must be ordered separately.

CHARACTERISTICS — WITH 1SM1

Operating Force ____1 oz., max.
Release Force ____4 grams, min.
Diff. Travel ______.030 in., max.
Overtravel _______.030 in., min.


.19 DIA X .09 WIDE CORROSION RESISTANT STEEL ROLLER AND ACTUATOR
2-56 NC X .500 REF ROUND HEAD MACHINE SCREW (2)
2-56 NC HEX NUT (2)
.125 APPROX PRETRAVEL
.09
LOCKWASHER (2)
1.00 R
.12
.562 APPROX OPERATING POSITION
.34
REF .375
.09
.025
DOTTED LINES INDICATE BASIC SWITCH IN PLACE
.25
FLEXIBLE INSULATOR
.16
.828 REF
.281 REF
UNLESS OTHERWISE SPECIFIED TOLERANCES ARE - ONE PLACE ±.030 TWO PLACE ±.015 THREE PLACE ±.005

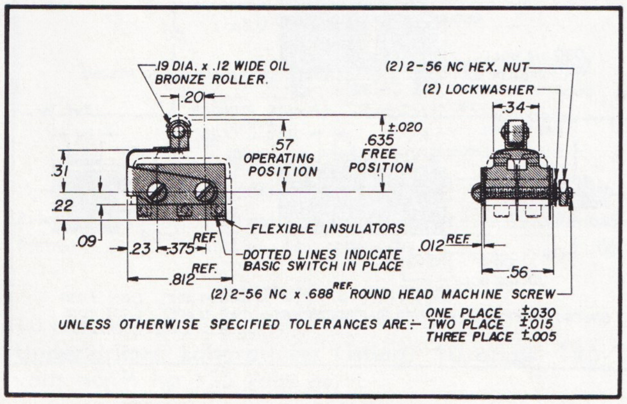
JS-31 TANDEM ROLLER LEAF



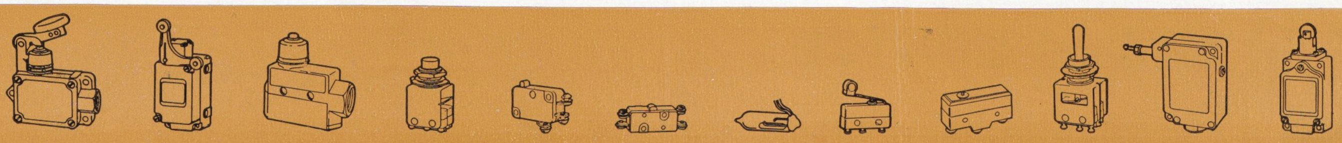
The illustration at right shows the actuator assembled with 2 Subminiature switches. Switches and auxiliary actuators must be ordered separately. All actuators are shipped complete with screws, nuts, lockwashers and coated fabric insulators.

CHARACTERISTICS — JS-31 ASSEMBLED WITH 2 1SM1 SWITCHES

Operating Force __ 40 oz., max.
Release Force _____16 oz., min.
Diff. Travel ____.015 in., max.
Wt.__.088 oz. (without switches)


.19 DIA. x .12 WIDE OIL BRONZE ROLLER.
(2) 2-56 NC HEX. NUT
(2) LOCKWASHER
.20
.34
±.020
.57 OPERATING POSITION
.635 FREE POSITION
.31
.22
.09
.23
.375 REF.
FLEXIBLE INSULATORS
DOTTED LINES INDICATE BASIC SWITCH IN PLACE
.012 REF.
.812 REF.
.56
(2) 2-56 NC x .688 REF ROUND HEAD MACHINE SCREW
UNLESS OTHERWISE SPECIFIED TOLERANCES ARE - ONE PLACE ±.030 TWO PLACE ±.015 THREE PLACE ±.005

Dimensions shown are for reference only and are subject to change without notice. Current drawings will be supplied upon request.



Two-Circuit Double-Break Basic Switches

GREATER FLEXIBILITY

The 1TB1 series of precision basic switches is the answer to industry's need for a small, two-circuit double-break switch for controlling two isolated circuits. This feature allows greater flexibility and simplicity of circuit design.

Use of a snap-action spring provides quick make and break of both the contacts in each double-break circuit. The knife edge provided on the center members of the snap-action spring pivots in "V" shaped grooves in the actuator. This action insures definite snap-action, accurate repeatability, and reduces the possibility of "dead-break".

The small size of the 1TB1 series switches (½x½x1¼) makes them desirable in two circuit applications where space and weight are at a premium.

ELECTRICAL RATING

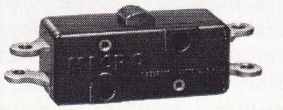
10 amps. 125-250 volts ac and 30 volts dc.
Underwriters' Laboratories Listing: 10 amps. 125-250 volts ac; ½ hp 125 volts ac.

1TB1-1

The 1TB1-1 has two screw terminals (one normally-open and one normally-closed) extending from either end of the phenolic case. Two .101 inch diameter holes will accept No. 3 screws for mounting from each side.

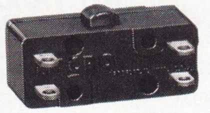
1TB1-2

The 1TB1-2 has two solder terminals (one normally-open and one normally-closed) extending from either end of the phenolic case. The .087 diameter holes in the terminals will accept No. 16 stranded wire. Mounting is the same as the 1TB1-1.



1TB1-3

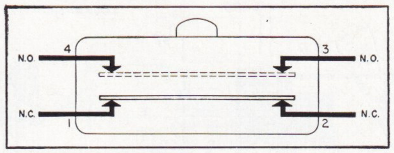
The 1TB1-3 has four solder terminals (two normally-open and two normally-closed) extending from the face side of the phenolic case. Mounting is the same as the 1TB1-1 but from the face side only.



OPERATING CHARACTERISTICS (For all 3 switches)

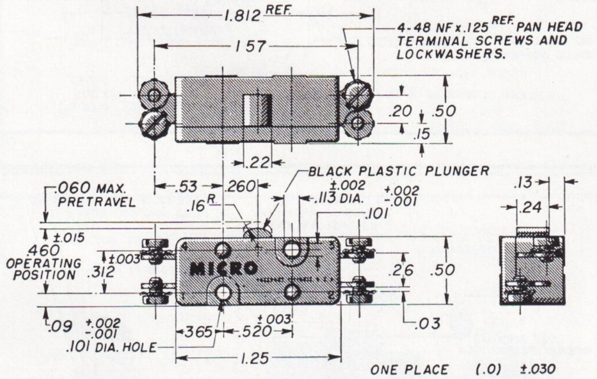
Oper. Force	7 to 13 oz. app.	Diff. Travel	.015 to .025 in.
Release Force	4 oz. min.	Overtravel	.010 in. min.

CONTACT ARRANGEMENT

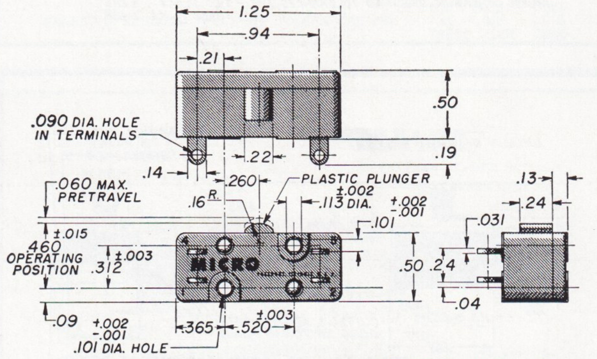

N.O.
4
3
N.O.
N.C.
1
2
N.C.

Contact arrangement is two-circuit double-break. (1 and 2 designate normally-closed circuit. 3 and 4 designate normally-open circuit.) A single-pole double-throw contact arrangement may be obtained by tying together the normally-open and normally-closed terminal on one end of the switch, and using this connection as the common terminal.

Both normally-open and normally-closed contacts must be of the same polarity.


1.812 REF.
1.57
4-48 NF x .125 REF. PAN HEAD TERMINAL SCREWS AND LOCKWASHERS.
.20
.50
.15
.22
BLACK PLASTIC PLUNGER
.060 MAX. PRETRAVEL
.53
.260
.16 R
±.002 .113 DIA.
+.002 -.001 .101
.13
.24
±.015
.460 OPERATING POSITION
±.003 .312
MICRO
.26
.50
.03
.09 +.002 -.001
.101 DIA. HOLE
.365
±.003 .520
1.25

UNLESS OTHERWISE SPECIFIED TOLERANCES ARE ÷ ONE PLACE (.0) ±.030 TWO PLACE (.00) ±.015 THREE PLACE (.000) ±.005


1.25
.94
.21
.50
.090 DIA. HOLE IN TERMINALS
.22
.19
.14
.060 MAX. PRETRAVEL
.260
.16 R
PLASTIC PLUNGER
±.002 .113 DIA.
+.002 -.001 .101
.13
.24
.031
±.015
.460 OPERATING POSITION
±.003 .312
MICRO
.50
.24
.04
.09 +.002 -.001
.101 DIA. HOLE
.365
±.003 .520

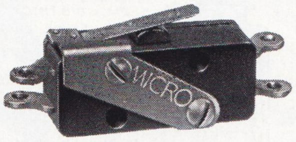
UNLESS OTHERWISE SPECIFIED TOLERANCES ARE ÷ ONE PLACE (.0) ±.030 TWO PLACE (.00) ±.015 THREE PLACE (.000) ±.005

Dimensions shown are for reference only and are subject to change without notice. Current drawings will be supplied upon request.

Aux. Actuators For Two-Circuit Switches

Auxiliary actuators will adapt the 1TB1-1 and 1TB1-2 switches to operate by cams, slides or other universal mechanical means. The actuators also provide supplementary overtravel to the switches. Two screws, (which serve as assembly and mounting screws) nuts and lockwashers are furnished with each actuator.

LEAF ACTUATOR



JT-1 ACTUATOR
(Assembled to 1TB1-2 switch)

This corrosion resistant leaf actuator is useful in applications providing slow or infrequent cam or slide operation.

Actuators and switches are sold as separate items and must be ordered separately.

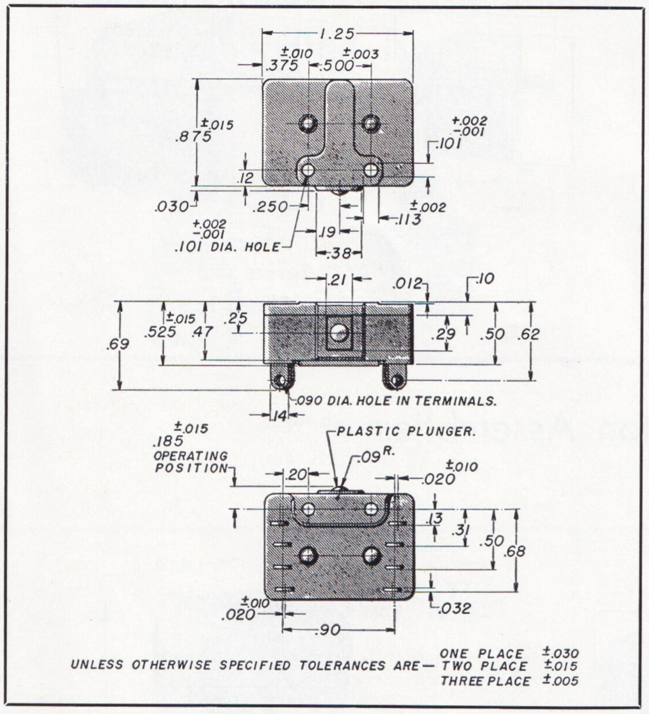
Auxiliary pushbutton actuators are also available. There is a choice of three button colors and 1" and ½" button diameters. Request Bulletin 22 for details.

ROLLER ACTUATOR

JT-5 ACTUATOR
(Assembled to 1TB1-2 switch)

This actuator has an oil-impregnated bronze roller which makes it especially useful in applications requiring rapid cam or slide actuation.

Four-Circuit Switches


1.25
±.010
.375
±.003
.500
±.015
.875
+.002
-.001
.101
.12
.030
.250
+.002
-.001
.101 DIA. HOLE
.19
.38
±.002
.113
.21
.012
.10
±.015
.525
.47
.25
.69
.29
.50
.62
.090 DIA. HOLE IN TERMINALS.
.14
±.015
.185
OPERATING POSITION
PLASTIC PLUNGER.
.09 R.
.20
±.010
.020
.13
.31
.50
.68
±.010
.020
.032
.90

UNLESS OTHERWISE SPECIFIED TOLERANCES ARE — ONE PLACE ±.030, TWO PLACE ±.015, THREE PLACE ±.005

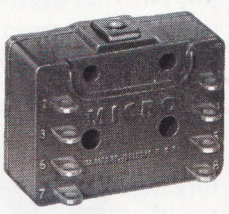
CHARACTERISTICS

Operating Force	20-36 oz.	Overtravel	.010 in. min.
Release Force	8 oz. min.	Diff. Travel	.025-.045 in.
Pretravel	.070 in. max.	Weight	.03 lb.

ELECTRICAL RATING

10 amps. 125-250 volts ac and 30 volts dc.
Underwriters' Laboratories Listing: 10 amps. 125-250 volts ac; ½ hp 125 volts ac.

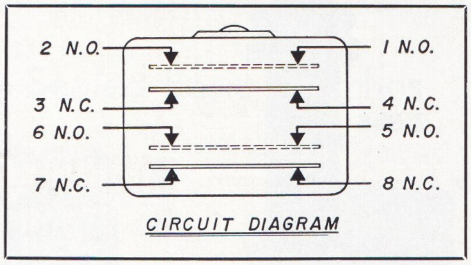
Catalog Listing 41TB5-3 is a four-circuit double-break switch for simultaneous control of four isolated circuits. This small switch is ideal in complex circuit applications where space and weight are prime factors in switch selection.



Catalog Listing
41TB5-3

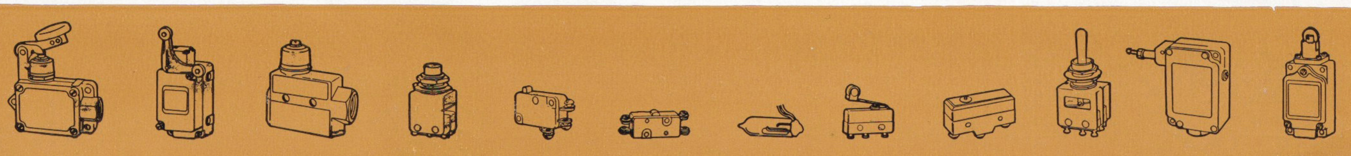
Two snap-action springs are operated with each actuation of the plunger, providing quick make and break of the contacts in each of the four double-break circuits. The knife edge center members of the snap-action springs pivot in "V" shaped grooves in the actuator, insuring definite snap-action and accurate repeatability, and reducing the possibility of "dead-break".

CONTACT ARRANGEMENT


2 N.O.
1 N.O.
3 N.C.
4 N.C.
6 N.O.
5 N.O.
7 N.C.
8 N.C.
CIRCUIT DIAGRAM

Contact arrangement is four-circuit double-break. 1 and 2, 5 and 6 designate normally open circuits. 3 and 4, 7 and 8 designate normally-closed circuits. Both normally-open and normally-closed contacts must be of the same polarity.

Dimensions shown are for reference only and are subject to change without notice. Current drawings will be supplied upon request.



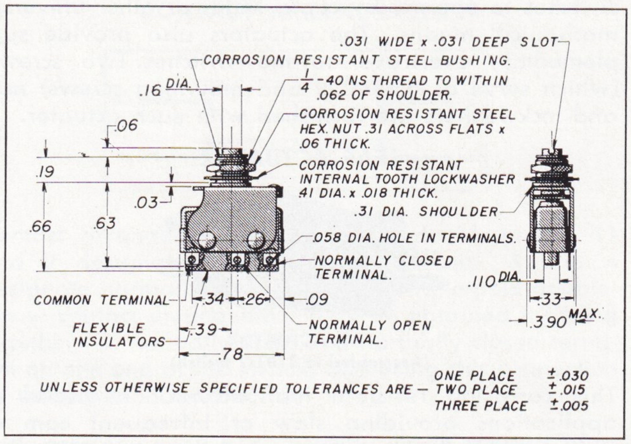
Small Basic Switch Assemblies

Screwdriver Actuated Switch

MICRO
SWITCH
FREEPORT, ILL. U.S.A.

Catalog Listing 1RA1

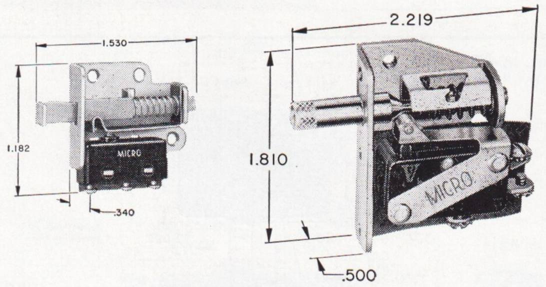
Catalog listing 1RA1 is a single-pole double-throw assembly designed to be operated by a 90° turn of a screwdriver. The 1RA1 gives designers of electronic equipment a switch that is useful where limited access is desired or when the switch is used only occasionally such as in testing circuits. Action of the 1RA1 is maintained in both directions. Detents at both extremes of actuator travel give positive operation. The switch can be used in panels up to 3/32 inch thick.


.031 WIDE x .031 DEEP SLOT
CORROSION RESISTANT STEEL BUSHING.
.16 DIA.
1/4-40 NS THREAD TO WITHIN .062 OF SHOULDER.
CORROSION RESISTANT STEEL HEX. NUT .31 ACROSS FLATS x .06 THICK.
.06
.19
CORROSION RESISTANT INTERNAL TOOTH LOCKWASHER .41 DIA. x .018 THICK.
.03
.31 DIA. SHOULDER
.66
.63
.058 DIA. HOLE IN TERMINALS.
NORMALLY CLOSED TERMINAL.
.110 DIA.
COMMON TERMINAL
.34
.26
.09
.33
FLEXIBLE INSULATORS
.39
NORMALLY OPEN TERMINAL.
.390 MAX.
.78
UNLESS OTHERWISE SPECIFIED TOLERANCES ARE — ONE PLACE ±.030
TWO PLACE ±.015
THREE PLACE ±.005

The following assemblies are designed around the basic switch types shown on the preceding pages. The assemblies as well as their basic switches are designed to meet the ever-growing need for reliability and precision where space and weight limitations are critical.

Detailed information on any of the assemblies is available by requesting the referenced literature from a nearby MICRO SWITCH Branch Office, or from MICRO SWITCH, A division of Minneapolis-Honeywell Regulator Company, Freeport, Illinois.

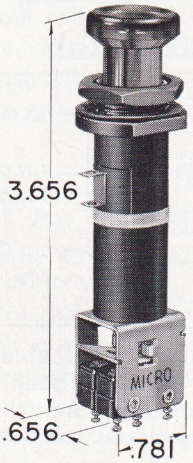
Door Interlock Assemblies


1.530
1.182
.340
MICRO
2.219
1.810
.500
MICRO

"AC" Series

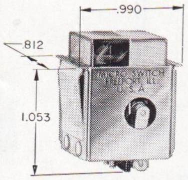
Request Data Sheet 186

Lighted Pushbutton Assemblies


3.656
MICRO
.656
.781

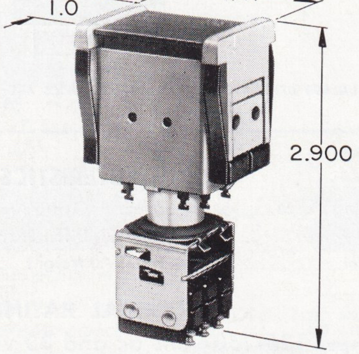
"50PB" Series

Request Data Sheet 133


.990
.812
1.053
MICRO SWITCH
FREEPORT, ILL.
U.S.A.

Miniaturized "302PB" Series

Request Data Sheet 182


1.0
1.414
2.900

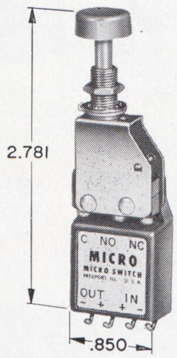
Modular "Series 2"

Request Catalog 67

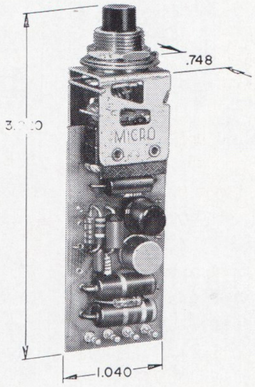
Dimensions shown are for reference only and are subject to change without notice. Current drawings will be supplied upon request.

Small Basic Switch Assemblies

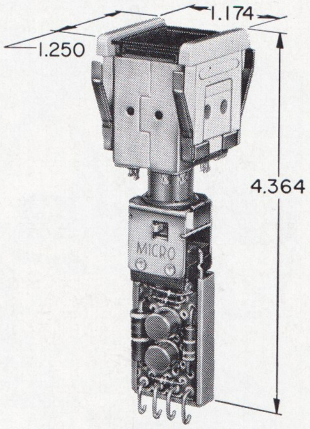
Electronic Circuit Pushbutton Switch Assemblies



"One-Shot" Series
Request Data Sheet 150

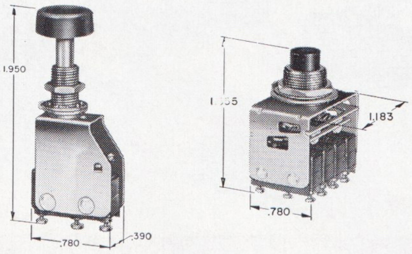


Long-Pulse "One-Shot" Series
Request Data Sheet 194


1.174
1.250
4.364

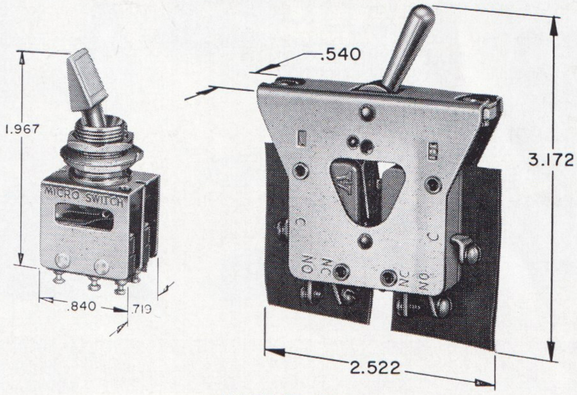
"Contact Buffer" Series
Request Data Sheet 177

Pushbutton Switch Assemblies (Unlighted Type)


1.950
.780
.390
1.183
.780

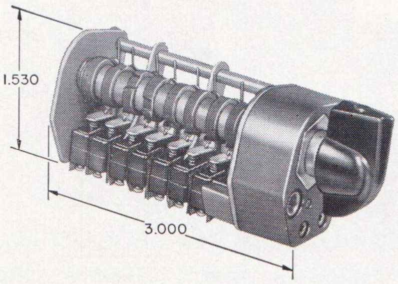
"PB" Series
Request Bulletin 22

Toggle Assemblies


1.967
.540
.840
.719
3.172
2.522

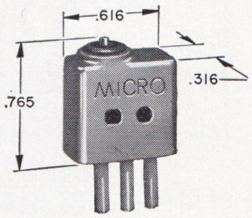
"AT" Series
Request Catalog 73

Rotary Assemblies

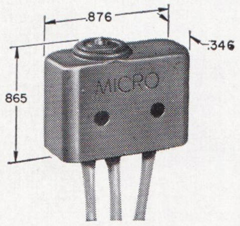


"AS" Series
Request Data Sheet 162

Sealed Basic Switches



"XE" Series



"SE" Series

Request Catalog 78

Dimensions shown are for reference only and are subject to change without notice. Current drawings will be supplied upon request.

MICRO
MICRO SWITCH
EXPLOSION PROOF SWITCH
MS

MICRO SWITCH
FREEPORT, ILLINOIS
A DIVISION OF HONEYWELL
IN CANADA: HONEYWELL CONTROLS LIMITED, TORONTO 17, ONTARIO

MICRO SWITCH, a division of Honeywell
Home Office and Factory — Freeport, Illinois

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Form No. 84-381H W-11-3 Printed in U.S.A.

MICRO SWITCH LIST PRICE and DISCOUNT SCHEDULE D-63P

Covering MICRO SWITCH Products in Catalog 63f

Prices effective July 1, 1963. This issue supersedes D-63N

TERMS AND CONDITIONS OF SALE

(a) **DATA** — All the data published in this schedule is effective as of the above date and is subject to change without notice.

(b) **ERRORS** — All stenographic and clerical errors are subject to correction.

(c) **DISCOUNTS AND PRODUCT CLASSES** — Discounts are based on quantity ordered and shipped against one purchase order. All MICRO SWITCH products of the same product class and on one purchase order may be combined for quantity discount. Switches of different product classes may not be combined for quantity discount. Unclassified products may not be combined for quantity discount.

(d) **SHIPMENTS** — All prices are F.O.B. Freeport, Illinois.

(e) **TAXES** — The amount of any and all taxes shall be added to the price and be paid by the purchaser because of transaction under effective statute, or in lieu thereof, the purchaser shall furnish the seller with tax exempt certificates acceptable to the taxing authorities.

(f) **TERMS OF PAYMENT** — Net thirty (30) days.

(g) **WARRANTY** — Seller warrants its products to be free from defects in material and workmanship under normal use and service and seller will repair or replace without charge any such product it finds to be so defective on its return to seller within one year of date of shipment to the original purchaser. The foregoing is in lieu of all other expressed or implied warranties (except of title), guarantees, obligations, or liabilities on seller's part.

CATALOG LISTING	LIST PRICE	DISCOUNT	PRODUCT CLASS	PAGE
V3-1	$1.10	H	13	4
V3-21	1.00	H	13	4
V3-23	1.00	H	13	4
V3-401	2.10	H	13	4
V3-1-D8	.95	H	13	4
V3-19	1.04	H	13	4
V3-7	.96	H	13	4
V3-32	.96	H	13	4
V3-419	2.04	H	13	4
V3-15	1.04	H	13	4
V3-29	1.15	H	13	4
V3-601	1.50	H	13	4
V3-26	1.65	H	13	4
V3-101	1.10	H	13	4
V3-121	1.00	H	13	4
V3-123	1.00	H	13	4
V3-119	1.04	H	13	4
V3-1301	20.10	H	13	4
V3-245	2.05	H	13	4
V3-75	3.75	H	13	4
JV-1	.32	H	4	5
JV-5	.42	H	4	5
JV-7	.38	H	4	5
JV-20	.84	H	4	5
JV-26	.52	H	4	5
JV-30	1.48	H	4	5
1SX1-T	2.50	H	81	6
3SX1-T	3.65	H	81	6
JX-20	.76	H	4	7
JX-25	1.47	H	4	7
JX-40	.25	H	4	7
JX-45	.70	H	4	7
JX-41	.25	H	4	7
JX-51	.71	H	4	7
111SM1-T	1.65	H	27	8
111SM2-T	2.00	H	27	8
1SM1-T	1.20	H	27	8
1SM3-T	1.20	H	27	9
11SM1-T	1.25	H	27	9
11SM3-T	1.25	H	27	9
1SM23-T	2.25	H	27	9
11SM23-T	2.30	H	27	9
12SM4-T	3.65	H	27	9
1SM1	1.20	H	27	9
1SM3	1.20	H	27	9
11SM1	1.25	H	27	9
11SM3	1.25	H	27	9
1SM23	2.25	H	27	9
11SM23	2.30	H	27	9
12SM4	3.65	H	27	9
1SM1-T2	1.25	H	27	9
1SM3-T2	1.25	H	27	9
11SM1-T2	1.30	H	27	9
11SM3-T2	1.30	H	27	9
1SM23-T2	2.30	H	27	9
11SM23-T2	2.35	H	27	9
12SM4-T2	3.70	H	27	9
1SM1-H2	1.20	H	27	9
1SM3-H2	1.20	H	27	9
11SM1-H2	1.25	H	27	9
11SM3-H2	1.25	H	27	9
1SM23-H2	2.25	H	27	9
11SM23-H2	2.30	H	27	9
12SM4-H2	3.65	H	27	9
JS-2	.22	H	4	10
JS-5	.53	H	4	10
JS-7	.27	H	4	10
JS-33	.33	H	4	10
JS-220	.57	H	4	11
JS-221	.57	H	4	11
JS-246	1.33	H	4	11
JS-31	.83	H	4	11
1TB1-1	1.75	H	45	12
1TB1-2	1.65	H	45	12
1TB1-3	1.70	H	45	12
JT-1	.39	H	4	13
JT-5	.70	H	4	13
41TB5-3	9.00	H	45	13
1RA1	5.00	H	21	14

DISCOUNT "H"

1 - 9	None	50 - 99	30%
10 - 19	10%	100 - 199	35%
20 - 49	20%	200 - 499	37%

For quotation on quantities greater than those shown, contact a MICRO SWITCH Branch Office

FORM 84 - 384P MS - 1 - 4 PRINTED IN U.S.A.

MICRO SWITCH
FREEPORT, ILLINOIS
A DIVISION OF HONEYWELL
IN CANADA: HONEYWELL CONTROLS LIMITED, TORONTO 17, ONTARIO

data sheet 197

Supplement to Catalog 63

MICRO SWITCH Precision Switches

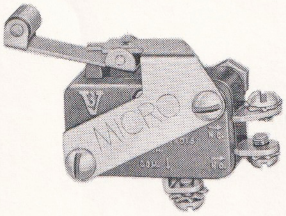
Auxiliary Actuators for "V3" Switches

The "JV" Series auxiliary actuators shown below increase the varieties available to adapt "V3" switches to operation by cams, slides and other means. In addition, the tandem actuators allow operation of two switches by a single device. Although they are shown assembled to switches, these stainless steel actuators are sold as separate items, unassembled. Mounting screws, nuts and lockwashers are furnished with each actuator. Actuators are available without hardware by contacting a MICRO SWITCH Branch office. The branch office will also provide pricing information on any item.

Characteristics shown are with actuators assembled to V3-1 switches. Dimensions are correct at the time of publishing but are subject to change without notice. Current drawings are available upon request.

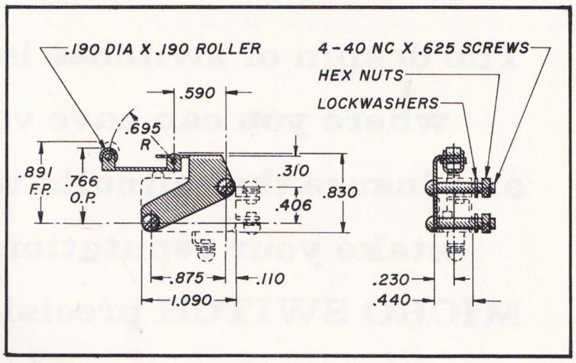
Catalog Listing JV-220

Low Force Roller Lever



CHARACTERISTICS

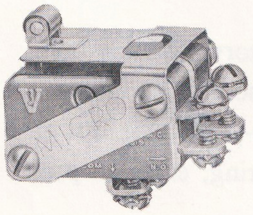
Operating Force	5 oz. max.
Release Force	1 oz. min.
Pretravel	.188 in. max.
Differential Travel	.078 in. max.
Overtravel	.062 in. min.



.190 DIA X .190 ROLLER
4-40 NC X .625 SCREWS
HEX NUTS
LOCKWASHERS
.590
.695 R
.891 F.P.
.766 O.P.
.310
.406
.830
.875
.110
1.090
.230
.440

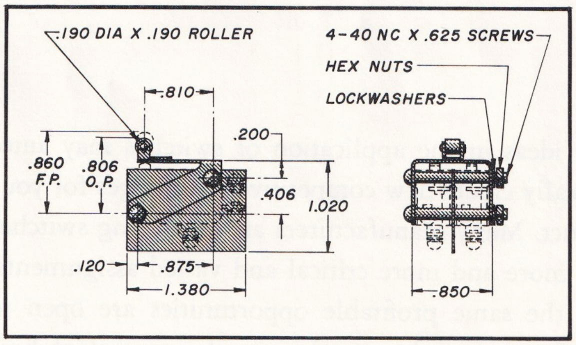
Catalog Listing JV-82

Tandem Roller Leaf



CHARACTERISTICS

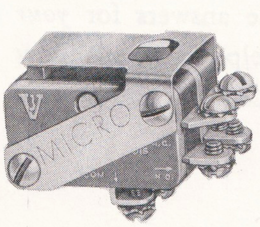
Operating Force	28 oz. max.
Release Force	10 oz. min.
Overtravel	.035 in. min.



.190 DIA X .190 ROLLER
4-40 NC X .625 SCREWS
HEX NUTS
LOCKWASHERS
.810
.200
.860 F.P.
.806 O.P.
.406
1.020
.120
.875
1.380
.850

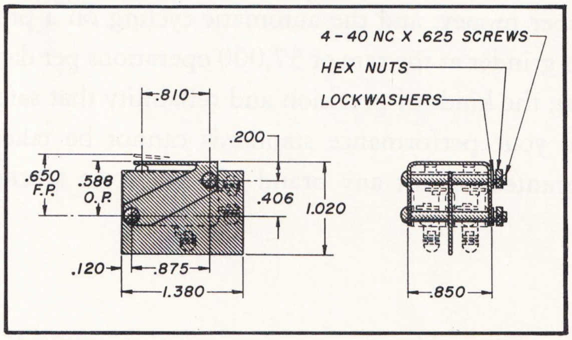
Catalog Listing JV-91

Tandem Leaf



CHARACTERISTICS

Operating Force	28 oz. max.
Release Force	10 oz. min.
Overtravel	.035 in. min.



4-40 NC X .625 SCREWS
HEX NUTS
LOCKWASHERS
.810
.200
.650 F.P.
.588 O.P.
.406
1.020
.120
.875
1.380
.850

FORM 84-519 MS-2-2 PRINTED IN U.S.A.

MICRO SWITCH
FREEPORT, ILLINOIS
A DIVISION OF HONEYWELL

IN CANADA: HONEYWELL CONTROLS LIMITED, TORONTO 17, ONTARIO

Don't compromise on switch reliability because . . .

Every touch of a Switch is a test of your equipment!

The design of switches is a specialty, one place where you can save valuable engineering time and insure that circuits will be made. But don't stake your reputation on less than the finest. MICRO SWITCH precision and reliability will safeguard your performance standards.

New ideas in the application of switches may automatically create new competitive advantages for your product. Many manufacturers are entrusting switches with more and more critical and varied assignments. And the same profitable opportunities are open to you. Some typical examples are the control of heat cycle and water flow of an automatic coffee maker, the ultra-sensitive responsibility of detecting the thickness of paper money, and the automatic cycling on a precision grinder at the rate of 57,000 operations per day.

But, the kinds of precision and reliability that safeguard your performance standards cannot be taken for granted in just any brand of switch. At MICRO SWITCH, the largest testing laboratory of its kind pretests switches for thousands and sometimes millions of operations, simulating on-the-job conditions of temperature, humidity, sand blasting, extreme pressure or shock and vibration.

MICRO SWITCH pioneered the design of small precision snap-action switches. Today, new applications have resulted in the design of over 12,000 different switches that make up the MICRO SWITCH line. There are sure to be some ready-made answers for *your* switch problems. For special help, see the Yellow Pages for the listing of the MICRO SWITCH branch office located near you.

H
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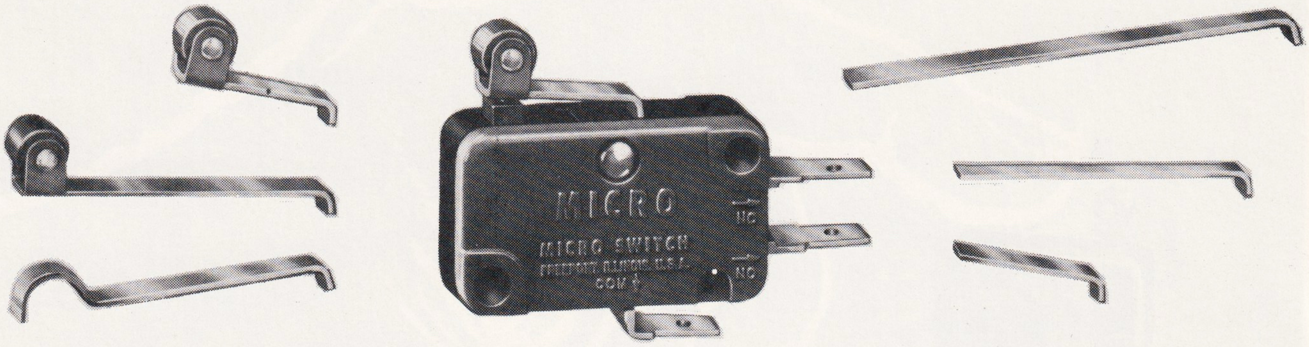
MICRO SWITCH
FREEPORT, ILLINOIS
A DIVISION OF HONEYWELL

IN CANADA: HONEYWELL CONTROLS LIMITED, TORONTO 17, ONTARIO

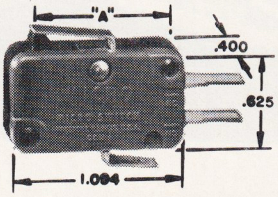
HONEYWELL MICRO SWITCH Precision Switches

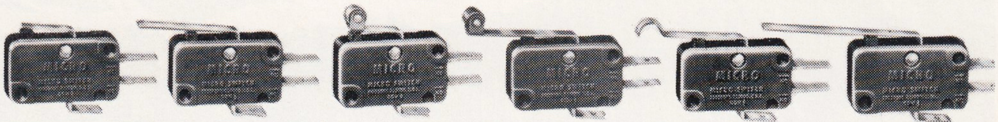
INTEGRAL ACTUATOR "V3" SWITCHES



The "V3L" Series of integral levers offer additional varieties of actuation for "V3" type switches. The 6 types will fit most applications, and all feature a hard stainless steel lever .025 thick and .170 wide.

These pivoted lever actuators will allow a minimum width of ganged assemblies. Information on possible variations may be requested from the nearest MICRO SWITCH Branch Office. Each has a competent staff of experienced **engineers** to offer you assistance in solving any of your switching problems.





	V3L-1-D8	V3L-2-D8	V3L-3-D8	V3L-4-D8	V3L-5-D8	V3L-6-D8
LEVER DIMENSION "A"	*0.840"*	*1.4"*	*0.81"*	*1.340"*	*1.285"*	*2.340"*
APPROX. LEVER RATIO	*1:1"*	*2.4:1"*	*1:1"*	*2.3:1"*	*2.1:1"*	*4.4:1"*
PRETRAVEL (MAX)	*0.0600"*	*0.125"*	*0.060"*	*0.125"*	*0.125"*	*0.260"*
OVERTRAVEL (MIN)	*0.131"*	*0.062"*	*0.031"*	*0.062"*	*0.062"*	*0.100"*
DIFFERENTIAL TRAVEL (MAX)	*0.016"*	*0.050"*	*0.016"*	*0.050"*	*0.050"*	*0.090"*
OPERATING POSITION (MAX)	*0.620"*	*0.660"*	*0.840"*	*0.870"*	*0.790"*	*0.066"*
OPERATING FORCE (MAX)	*14 oz.*	*8 oz.*	*14 oz.*	*8 oz.*	*8 oz.*	*4 oz.*
RELEASE FORCE (MIN)	*3 oz.*	*1 oz.*	*3 oz.*	*1 oz.*	*1 oz.*	*½ oz.*
LIST PRICE	**$1.05**	**$1.05**	**$1.25**	**$1.25**	**$1.05**	**$1.05**

Prices Subject to Discount Schedule H
Data and Prices published herein are subject to change without notice.

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FREEPORT, ILLINOIS
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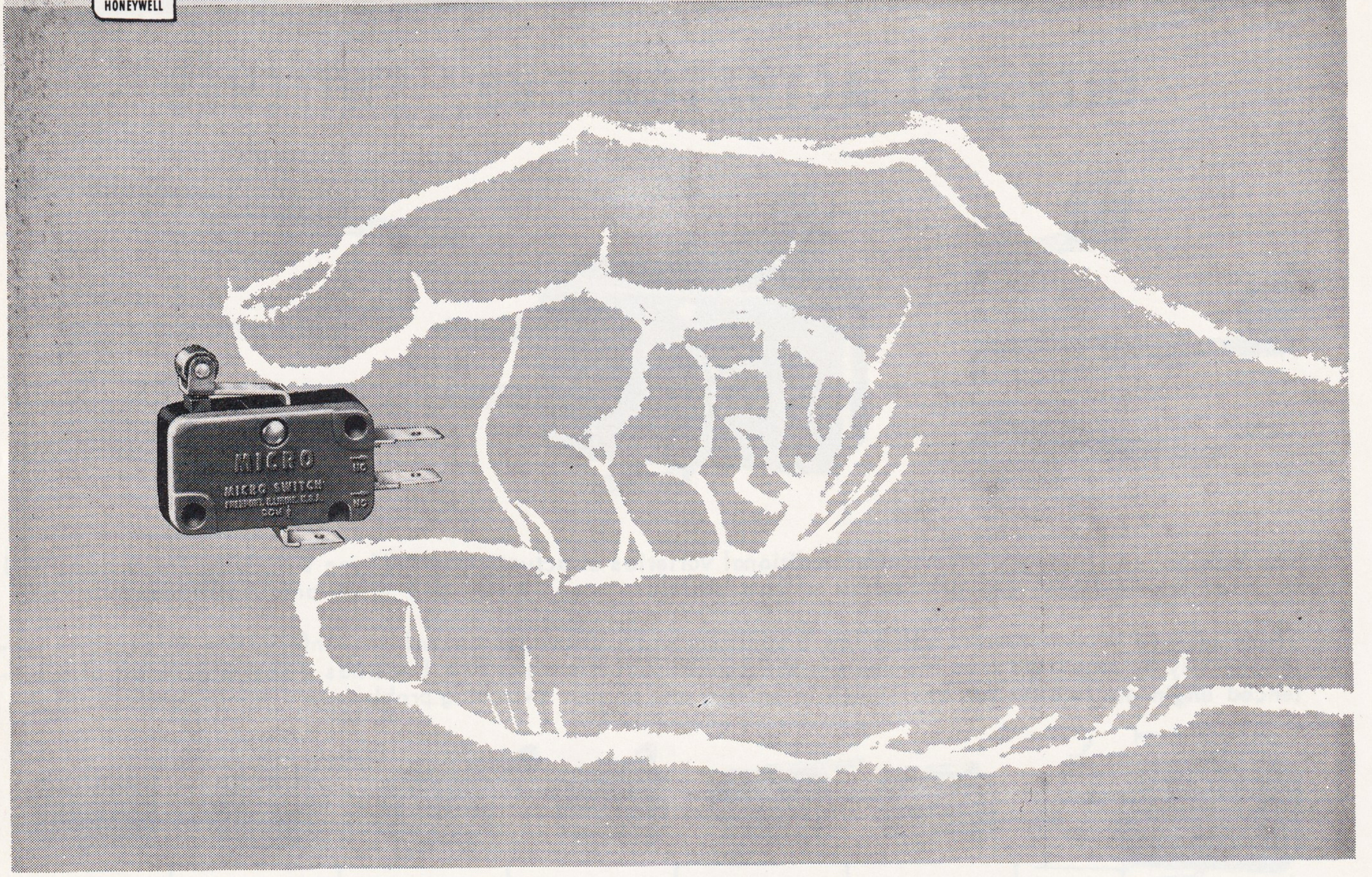
HONEYWELL **MICRO SWITCH Precision Switches**



"V3" HIGH CAPACITY MINIATURE SWITCHES

TAILORED TO YOUR NEEDS —RIGHT OFF THE SHELF

Simply because they are so readily adaptable to so many applications, Series "V3" Miniatures are among the most widely used snap-action switches.

Added variations in terminals, circuitry, actuators and assemblies have continually extended their capabilities in aircraft, industrial equipment, appliances, vending and business machines.

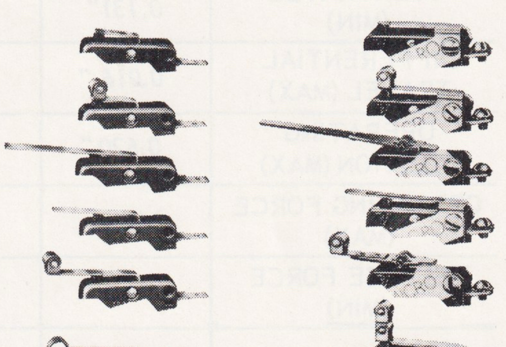
Twenty years of refinement by MICRO SWITCH has resulted in packing increasingly higher capacity and greater reliability into these miniatures. They are listed by UL and CSA for 15 amps. 125-250 vac.

"V3" Miniatures are the heart of a variety of assemblies: Multi-circuit Toggles, Rotary Selectors, Door Interlocks, etc.

Write for Catalog 63 "Small Basic Switches", or call our Branch Office nearest you (see Yellow Pages).

COMPLETE SELECTION OF ACTUATORS

INTEGRAL AUXILIARY



HONEYWELL **MICRO SWITCH**
FREEPORT, ILLINOIS
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